The Growth of Solar Radiated Yeast

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Abstract

This researcher plans to determine if solar radiation affects the growth of yeast. The irradiated yeast was obtained from a sample exposed in space during a Space Shuttle flight of September 9-20, 1994. Further, the control groups were held at: 1. Goddard Space Flight Center (GSFC) in Greenbelt, Maryland and 2. South Dakota School of Mines and Technology.

The procedure used was based on the fact that yeast is most often used in consumable baked goods. Therefore, the yeast was incorporated into a basic Betty Crocker bread recipe. Data was collected by placing measured amounts of dough into sample containers with fifteen minute growth in height measurements collected and recorded. This researcher assumed the viability of yeast to be relative to its ability to produce carbon dioxide gas and cause the dough to rise. As all ingredients and surroundings were equal, this researcher assumed the yeast will produce the only significant difference in data collected.

This researcher noted the approximate use date on all sample packages to be prior to arrival and experiment date. All dates equal, it was then assumed each would act in a similar manner of response. This assumption will allow for equally correct data collection.

Introduction

For the past 3 years I have been going to the Scientific Knowledge for Indian Learning and Leadership (SKILL) camp that is funded solely by NASA. It was the work of NASA that enabled me, and other students just like me, to send small payloads into space. It is to my knowledge that the Get Away Special (GAS) is the only small payload that has ever carried yeast.

Purpose

The purpose of this project was to find out whether or not solar radiation affects the growth of yeast in a bread dough mix.

Hypothesis

I believe that the yeast that was sent into space will have a reaction to the solar radiation, it will react in a way that it will not grow as rapidly or grow as much. The solar radiation affects things in ways that it harms it or even may mutate it in sense. In most cases, when living things are exposed to radiation they do not adapt to their own living environment, their growth rate is poor, and in some cases it even may die. This may also happen to the yeast when it is ready to make the dough rise.

Procedure

I obtained twelve packages of Red Star Quick Rise Yeast, four of which went into space, four that stayed at the GSFC as a control group and four that stayed at the South Dakota School of Mines and Technology, also as a control group. I then sent eight packages to NASA's GSFC. NASA kept four on the ground and sent four into space on the Space Shuttle Discovery, mission STS-64. The yeast was in flight for 11 days and was exposed at that time to the solar radiation.

After receiving the yeast back from space, I mixed up the two different batches of dough of the control yeast to find out whether or not keeping the yeast at different places would affect its growth. It did not affect the growth, so in my project I only used the yeast that was sent into space and the yeast that was kept by NASA. At that point I mixed up the two different batches of dough, the dough containing yeast that was in flight, and dough that contained yeast kept by NASA. After the dough was mixed, I weighed it into 4 ounce masses, 10 masses for each group. I then measured and recorded the growth of the yeast in all 20 beakers every fifteen minutes for two hours.

Results

With the data collected in my results, I found that the yeast that was sent into flight grew less than my control yeast. The average growth differences among the 2 groups for every fifteen minutes were 0.5cm for the first fifteen minutes, 0.5cm, 0.2cm, 0.3cm, 0.3cm, 0.2cm, 0.3cm, and 0.4cm. The average final growth of the dough was 11.9cm for the flight yeast whereas it was 12.3 for the control yeast.

Conclusion

I now conclude that flight yeast has a slight growth difference than the control yeast. The flight yeast did not grow as much or as fast as the control group did. So as you can see, the solar radiation had a slight affect on the growth of yeast in bread dough.

Flight

The specimens were flown on Space Shuttle Discovery STS-64, from September 9-20, 1994. They were in a canister called the GAS. During this flight they were exposed to solar radiation. The yeast was also kept at a constant controlled pressure.

Material

In my experiment I used 10,250 ml beakers a thermometer, that I read in Fahrenheit, a scale read in ounces, and a ruler read in centimeters. The yeast used was Red Star Quick Rise Yeast.

References

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